UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,305	07/09/2003	Masahiko Kubota	03500.017376.	7106

5514 7590 10/05/2004

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
SHAH, MANISH S	
ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,305	KUBOTA ET AL.	
	Examiner	Art Unit	
	Manish S. Shah	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/6/03;1/12/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohkuma et al. (# EP 0734866).

Ohkuma et al. discloses a method of manufacturing a microstructure, including: a step of forming a thermally cross linked first positive photosensitive material layer on a substrate, a step of forming on the first positive photosensitive material layer a second positive photosensitive material layer different from the first positive photosensitive material layer in a photosensitive wavelength range (see figure: 19-25), a step of firstly forming a pattern on the second positive photosensitive material layer by decomposing and then developing only a desired area in the second positive photosensitive material layer, and a step of secondly forming a pattern different from that formed on the second positive photosensitive material layer on the first positive photosensitive material layer by decomposing and then developing a predetermined area in the first positive photosensitive material layer (page: 5, line: 1-20; line: 28-50), wherein the first positive photosensitive material layer is an ionizing radiation decompositive positive resist composed of a methacrylic copolymer composite mainly containing a methacrylate and

also containing methacrylic acid as a thermal crosslinking factor, where a methacrylic acid unit is 2 to 30 wt % and copolymer molecular weight is 5,000 to 50,000, and the second positive photosensitive material layer is an ionizing radiation decompositive positive resist which mainly contains polymethyl isopropenyl ketone (page: 6, line: 15-50; page: 7, line: 25-45). They also disclose that the methacrylic copolymer composite is formed by radical polymerization and the first positive photosensitive material layer is thermally cross-linked by dehydration reaction (page: 6, line: 15-35).

2. Claims 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohkuma et al. (# EP 0734866).

Ohkuma et al. discloses a method of manufacturing a liquid discharge head (see Abstract) including: a step of forming a mold pattern by a removable resin in a liquid channel forming portion on a substrate on which is formed a liquid discharge energy generating element, and a step of coating and then curing a coating resin layer on the substrate so as to coat the mold pattern to form a liquid channel by dissolving away the mold pattern (figure: 1-9; 19-25), wherein the step of forming the mold pattern successively includes: a step of forming on the substrate a first positive photosensitive material layer thermally cross linked by means of a thermal crosslinking reaction; a step of forming on the first positive photosensitive material layer a second positive photosensitive material layer different from the first positive photosensitive in a photosensitive wavelength range (page: 5, line: 1-20; line: 28-50); a step of forming a desired pattern on the second positive photosensitive material layer by decomposing and then developing only a desired pattern on the second positive photosensitive

material layer by means of an ionizing radiation for exposing the second positive photosensitive material layer onto the substrate on which two layers of the positive photosensitive material layers are formed (page: 5, line: 28-50); and a step of forming another desired pattern on the first positive photosensitive material layer by decomposing and then developing a predetermined area on the first positive photosensitive material layer by means of an ionizing radiation for exposing the first positive photosensitive material layer onto the substrate on which the desired pattern is formed on the second positive photosensitive material layer (figure: 19-25), and the first positive photosensitive material layer is an ionizing radiation decompositive positive resist composed of a methacrylic copolymer composite mainly containing a methacrylate and also containing methacrylic acid as a thermal crosslinking factor, where a methacrylic acid unit is 2 to 30 wt % and copolymer molecular weight is 5,000 to 50,000, and the second positive photosensitive material layer is an ionizing radiation decompositive positive resist which mainly contains polymethyl isopropenyl ketone (page: 6, line: 15-50; page: 7, line: 25-45). They also disclose the steps of coating a negative photosensitive coating resin film on the patterned first positive photosensitive material layer and second positive photosensitive material layer; a step of forming a discharge port portion by exposing and then developing a pattern including a discharge port communicated with the liquid channel of the negative photosensitive coating resin film; a step of decomposing the first positive photosensitive material layer and the second positive photosensitive material layer by irradiating an ionization radiation onto the first and second positive photosensitive material layers at a wavelength range in which decomposition reaction occurs in the both first and second positive photosensitive

material layers; and a step of forming the liquid channel by immersing the substrate into an organic solvent to dissolve away the first and second positive photosensitive material layers (figure: 19-31).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyagawa et al. (# US 2003/0011655).

The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Miyagawa et al. discloses a method of manufacturing a microstructure, including: a step of forming a thermally cross linked first positive photosensitive material layer on a substrate, a step of forming on the first positive photosensitive material layer a second positive photosensitive material layer different from the first positive photosensitive material layer in a photosensitive wavelength range (see figure: 1-5), a step of firstly forming a pattern on the second positive photosensitive material layer by decomposing

and then developing only a desired area in the second positive photosensitive material layer, and a step of secondly forming a pattern different from that formed on the second positive photosensitive material layer on the first positive photosensitive material layer by decomposing and then developing a predetermined area in the first positive photosensitive material layer (figure: 1-5), wherein the first positive photosensitive material layer is an ionizing radiation decompositive positive resist composed of a methacrylic copolymer composite mainly containing a methacrylate and also containing methacrylic acid as a thermal crosslinking factor, where a methacrylic acid unit is 2 to 30 wt % and copolymer molecular weight is 5,000 to 50,000, and the second positive photosensitive material layer is an ionizing radiation decompositive positive resist which mainly contains polymethyl isopropenyl ketone ([0095]-[0096]). They also disclose that the methacrylic copolymer composite is formed by radical polymerization and the first positive photosensitive material layer is thermally cross-linked by dehydration reaction ([0020]-[0044]).

4. Claims 4-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyagawa et al. (# US 2003/0011655).

The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Miyagawa et al. discloses a method of manufacturing a liquid discharge head (see Abstract) including: a step of forming a mold pattern by a removable resin in a liquid channel forming portion on a substrate on which is formed a liquid discharge energy generating element, and a step of coating and then curing a coating resin layer on the substrate so as to coat the mold pattern to form a liquid channel by dissolving away the mold pattern (figure: 1-5), wherein the step of forming the mold pattern successively includes: a step of forming on the substrate a first positive photosensitive material layer thermally cross linked by means of a thermal crosslinking reaction; a step of forming on the first positive photosensitive material layer a second positive photosensitive material layer different from the first positive photosensitive in a photosensitive wavelength range ([0020]-[0044]); a step of forming a desired pattern on the second positive photosensitive material layer by decomposing and then developing only a desired pattern on the second positive photosensitive material layer by means of an ionizing radiation for exposing the second positive photosensitive material layer onto the substrate on which two layers of the positive photosensitive material layers are formed ([0020]-[0044]); and a step of forming another desired pattern on the first positive photosensitive material layer by decomposing and then developing a predetermined area on the first positive photosensitive material layer by means of an ionizing radiation for exposing the first positive photosensitive material layer onto the substrate on which the desired pattern is formed on the second positive photosensitive material layer (figure: 1-5), and the first positive photosensitive material layer is an ionizing radiation decompositive positive resist composed of a methacrylic copolymer composite mainly containing a methacrylate and also containing methacrylic acid as a

thermal crosslinking factor, where a methacrylic acid unit is 2 to 30 wt % and copolymer molecular weight is 5,000 to 50,000, and the second positive photosensitive material layer is an ionizing radiation decompositive positive resist which mainly contains polymethyl isopropenyl ketone ([0095]-[0096]). They also disclose the steps of coating a negative photosensitive coating resin film on the patterned first positive photosensitive material layer and second positive photosensitive material layer; a step of forming a discharge port portion by exposing and then developing a pattern including a discharge port communicated with the liquid channel of the negative photosensitive coating resin film; a step of decomposing the first positive photosensitive material layer and the second positive photosensitive material layer by irradiating an ionization radiation onto the first and second positive photosensitive material layers at a wavelength range in which decomposition reaction occurs in the both first and second positive photosensitive material layers; and a step of forming the liquid channel by immersing the substrate into an organic solvent to dissolve away the first and second positive photosensitive material layers (figure: 1-5). They also discloses a columnar member for trapping dust is formed of a material composing the liquid channel in the middle of the liquid channel, which is formed in the liquid channel does not reach the substrate (figure: 7; [0116]). They also disclose that the liquid supply port commonly connected to each of the liquid channels are formed in the substrate, and a height of the liquid channel in a center portion of the liquid supply port is lower than that of the liquid channel in an opening edge portion of the liquid supply port (figure: 8). They also discloses that a sectional shape of a bubble generating chamber provided above a liquid discharge energy generating element has a protruded form (figure: 9-21).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manish S. Shah whose telephone number is (571) 272-2152. The examiner can normally be reached on 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MSS
9/30/04

Manish S. Shah
Examiner
Art Unit 2853